

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
31 May 2001 (31.05.2001)

PCT

(10) International Publication Number  
**WO 01/38926 A1**

(51) International Patent Classification<sup>7</sup>: **G02B 27/02**,  
27/28, G02F 1/1335, G08B 5/36, G09F 19/12

(74) Agents: SIMS, Anthony, W. et al.; 29 Clarence Street,  
Private Bag 3140, Hamilton 2001 (NZ).

(21) International Application Number: PCT/NZ00/00220

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,  
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,  
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,  
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(22) International Filing Date:  
6 November 2000 (06.11.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
501334 25 November 1999 (25.11.1999) NZ

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian  
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European  
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,  
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,  
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): DEEP  
VIDEO IMAGING LTD [NZ/NZ]; Airport Road, Mys-  
tery Creek, RD 2, Hamilton (NZ).

**Published:**

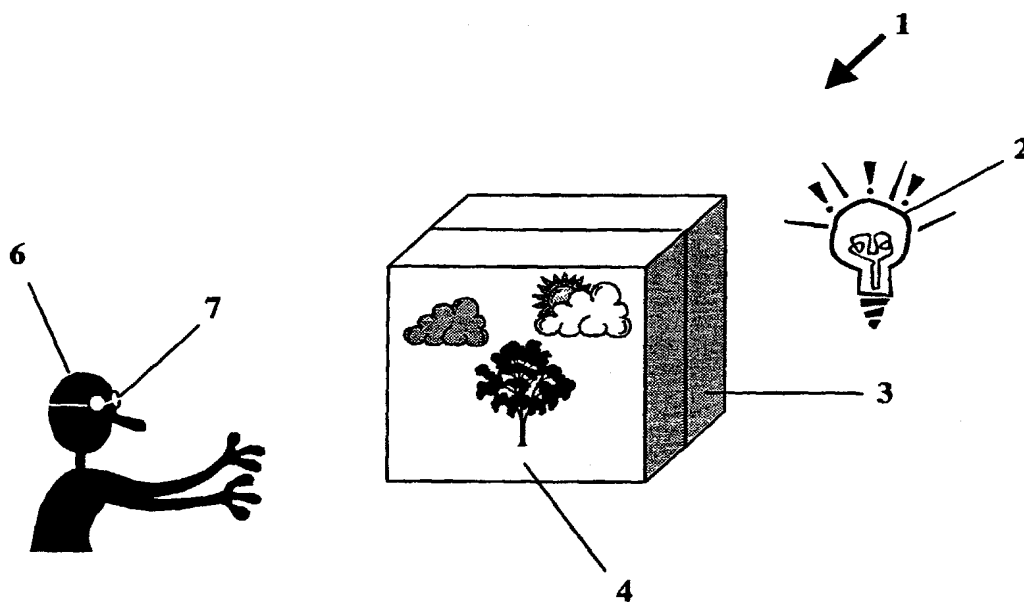
— With international search report.

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): ENGEL, Gabriel, Da-  
mon [US/NZ]; 19a Rostrevor Street, Hamilton (NZ).

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: A METHOD OF SELECTIVE VIEWING



(57) Abstract: Latent images on a screen (4) are polarisation encoded, so as to be visible only to a viewer (6) having suitable polarising means (7). The images may be projected via a liquid crystal display (4) having a rear polariser (3) and no front polariser. Images may further be colour encoded, with the polarising means (7) comprising suitably coloured tinted glasses. Alternatively, the images may be projected onto a window which has polarising material (7) on one side, such that they are visible from only one side of the window. Such a window can be used for advertising purposes, or to display an alarm signal which is not visible to an intruder or burglar.



WO 01/38926 A1

## A METHOD OF SELECTIVE VIEWING

### TECHNICAL FIELD

This invention relates to a method of selective viewing.

In particular, but not necessarily exclusively, the present invention relates to a  
5 method allowing only selected viewers to view an image on a display panel, screen  
or window.

### BACKGROUND ART

There are many instances where it will be desired to have a means by which only  
selected people can view images and the like on screens or displays.

10 For example, often many workers in an office situation or a research and  
development role use computers that display confidential information. If there are  
visitors or unauthorised personnel in the region of the computer screens, it would be  
desirable to have means by which the images on the screen can be readily obscured  
from the view of the visitors but still visible to the workers.

15 Early developments of LCD screens provided a narrow viewing angle. However,  
recent technology has enabled the viewing angle of LCD screens to widen. This has  
added to security problems.

In another situation, it would be beneficial to have the ability to have selective  
viewing in a window display, say in retail areas. Currently, a compromise must be  
20 made as to whether to replace the window with a sign or keep a window and not  
realise the profits from advertising. It would be desirable if there could be provided  
a means by which people on one side of a "window" (say in a shop) can see through  
the window as per usual. Whereas, people on the other side of the "window" (say in  
the street) would see a display.

Not only would the above be useful for advertising purposes, but could also be useful in control room situations and where monitoring of reactions of viewers is required.

5 In some situations it would be desired to have a single screen whereby different viewers can see images specifically for them, other viewers can view different images, and some other viewers may see nothing at all, dependent upon the methods employed by each viewer.

10 It would also be desirable if there could be provided some form of visual alarm, perhaps instead of or as a supplement to an audio alarm. For example, there may be a window or screen which indicates that someone is in trouble which cannot be seen by a burglar, but can be seen by those who can help. This system may be used in homes, shops and taxi cabs as an example.

It is an object of the present invention to address the above problems, or at least provide the public with the use of a choice.

15 **DISCLOSURE OF INVENTION**

According to one aspect of the present invention there is provided a method of providing selective viewing characterised by the steps of:

- (a) placing a selected image or images onto a screen, and
- (b) ensuring that the selected image has a specific polarity, and
- 20 (c) causing light to emerge from the screen having a different polarity or polarities to the image.

According to another aspect of the present invention there is provided a screen for use with the method above which can provide images of a specific polarity – different to the polarity of light emerging from other parts of the screen.

The term screen should be considered in its broadest form encompassing any device capable of showing an image including video display units, projector screens, windows, wallpanels, watch faces and the like.

5 The term image should be interpreted as meaning any type of image, whether a picture, written words and so forth.

The term polarity refers to the light from the image being polarised or aligned in a particular direction or range of directions.

It can be seen that the present invention can be used in a variety of situations.

10 For example, in one embodiment of the present invention there may be provided a projector which projects images to a large remote screen say a wall or curtain. This may be seen by multiple viewers - for example, in picture theatres, conference halls and the like.

15 To achieve images on a large screen such as having selected polarity, the projector may have a light source from which light passes through a polariser, and then through a material that can affect polarity in a number of means. This material shall now be referred to as a liquid crystal display although it may be possible that other devices may be used to affect polarity.

20 Manipulation of the liquid crystal display can cause specific images to have a specific polarity while twisting the polarity of the light from the projector not associated with images in other ways.

In this embodiment, the images projected may all be of one polarity in combination with light of different polarities. Thus, viewers who do not have any visual aids looking at the screen will not see any of the images which have a specific polarity. This is because these are effectively obscured by the light received by the viewer in  
25 differing polarities.

However, selected viewers may have a visual aid in the form of polarised material to which they can view the screen. Because the material is polarised, most of the light from the screen is blocked out, except of those of the image having a specific polarity.

- 5 The polarised material can come in a number of forms. For example, the polarised material may be in the form of a card which the viewer holds up, a fixed screen through which they look through, or the polarised material may merely be polarised sunglasses.

One embodiment of the present invention there may be provided a number of VDU  
10 screens on a wall, each of which are emitting images of different polarisation. Thus, viewers having sunglasses of different polarities can view different images to each other. Alternatively, there may be provided glasses to the viewers which have adjustable polarity so a viewer can actually select which of the images he/she wishes to view.

- 15 According to a further aspect of the present invention there may be provided viewing devices with adjustable polarity.

If the screen is a video display unit (VDU), then in preferred embodiments of the present invention this is a liquid crystal display screen. Typically, liquid crystal display (LCD) screens comprise of a back light, a back polariser which aligns the  
20 light in one direction, a LCD panel which can be manipulated to form various images in a certain polarity, and a front polariser allowing the viewer to actually view the images formed by the LCD panel.

In one embodiment of the present invention, the VDUs do not have a front polariser. Instead, the selected viewers have a polarising material themselves with which to  
25 view the image on the screen. Thus, a viewer without a polarising material will see white light (or whatever colour the back light is) whereas the selected viewers will

see images as on a normal LCD screen.

Thus the screen will have the main components of a back light, back polariser and LCD screen.

The present invention can be used to provide a theme of minimalism in offices. For  
5 example, LCD's to unauthorised viewers may seem blank, thus providing a soothing atmosphere.

In a variation of the present invention, the images may be selectively coloured. Therefore viewers can be given special polarised glasses which contain a colour tint. Thus, those viewers without glasses would see nothing, those with red polarised  
10 glasses would see an image specific to them while those with green tinted glasses (and so forth) will see an image specific to them.

While these images may be mixed on one screen, in other embodiments, the screen may be divided up into a grid like pattern with selected images in each area of the grid so the viewers know at which screen to direct their attention.

15 One aspect of the present invention includes the provision of a window having a polarising material on one side of the window which allows people on one side to view images projected onto that window whereas people on the other side will not see these. For example, this version of the present invention can be used as a window in a shop front. People on one side can see through the window, either into  
20 the shop or outside from the shop. Alternatively, viewers on the other side of the window may see a display on the window itself. These types of windows may be placed in buses, buildings, even houses and cars.

Some embodiments of the present invention, such a window can be used as a visual alarm. Often, audible alarms panic burglars and other felons – which can be  
25 dangerous. The present invention, the burglar/felon would only see through a

window as normal, whereas others on the other side of the window may see an alarm message being displayed.

The present invention may also be used as in the place of a one way mirror, for example in controlled situations where monitoring reactions of viewers is required.

- 5 The present invention has a number of applications. The present invention can be used in security applications, to remove distracting visual clutter, in advertising, to provide visual alarms and so forth.

Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

10 **BRIEF DESCRIPTION OF DRAWINGS**

Further aspects of the present invention will become apparent from the following description which is given by way of example only and with reference to the accompanying drawings in which:

Figures 1A and 1B are schematics of one embodiment of the present invention.

15 **BEST MODES FOR CARRYING OUT THE INVENTION**

Figures 1A and 1B show in highly schematic form one means by which the present invention can be implemented.

- A screen generally indicated by arrow (1) in accordance with the present invention comprises in a single package a light source (2), a back polariser (3) and an LCD  
20 screen (4).

For the purpose of illustration, these are shown in schematic exploded form. It should be appreciated that in preferred embodiments of the present invention looks to the uninitiated to be a standard LCD screen.

The present invention may work as follows.

The light source (2) emits non-polarised light, that is light in all directions. Light in one direction passes through the polarising material (3) and then through the LCD screen (4).

- 5    The liquid crystals on the LCD screen (4) are manipulated to either allow the polarised light to pass through the screen, or to twist the polarised light in a different direction depending on the way the LCD screen is driven, the direct light or the untwisted light may form the image which is desired to view.

- 10   Because the screen (1) does not have a front polariser as is usual, the viewer (5) that does not have polarising glasses sees all of the light that comes through the LCD screen (4) – whether is polarised in one direction or the other. Thus, the viewer (5) sees effectively a blank screen.

In contrast, in figure 1B a viewer (6) having polarised glasses (7) effectively blocks light of one polarisation to see an image on the LCD screen (4).

- 15   It should be appreciated that the glasses (7) may in some instance be a screen or some other material through which the viewer can see the screen. The important thing is that not all viewers can discern the polarised image.

- Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without  
20   departing from the scope of the appended claims.



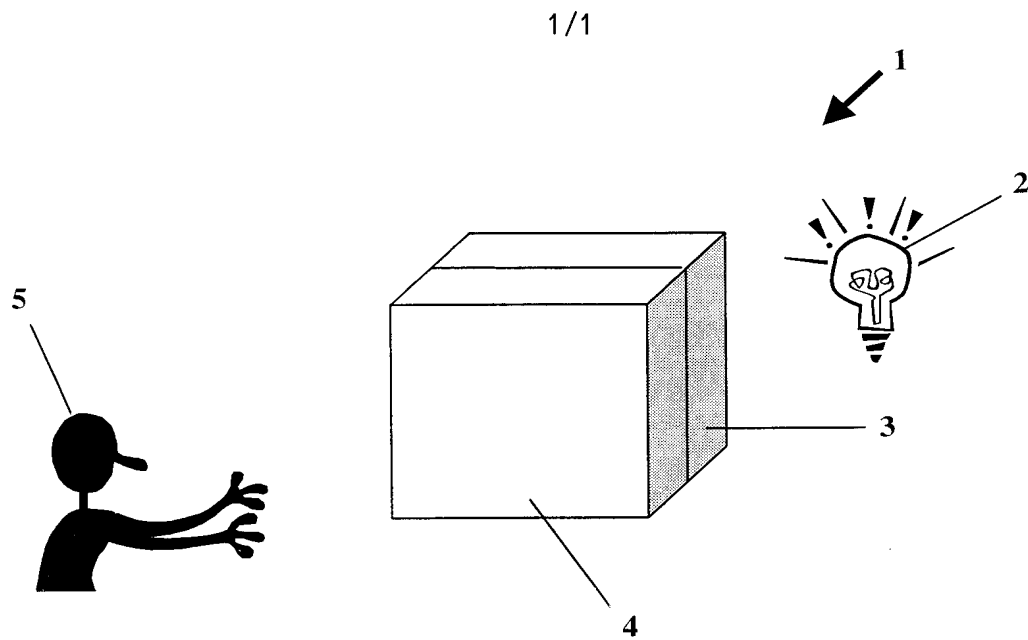
**CLAIMS**

1. A method of providing selected viewing characterised by the steps of:
  - a) placing a selected image or images onto a screen, and
  - b) ensuring that the selected image has a specific polarity, and
  - c) causing light to emerge from the screen having a different polarity or polarities to the image.
2. A method as claimed in claim 1 characterised by a further step of using a projector to project the images.
3. A method as claimed in claim 2 wherein the projector has a light source from which light passes through a polariser and then the light passes through a material that can prevent polarity by a number of means.
4. A method as claimed in claim 3 wherein there the material is a liquid crystal display.
5. A method as claimed in any claim 1 to 4 wherein the images can be viewed by having viewers looking through polarised material at the screen.
6. A method as claimed in claim 5 wherein the polarised material contains a coloured tint so that the viewers can see images that are selectively colored.
7. A method as claimed in any one of claims 1 to 6 wherein the screen is divided up into grid like pattern with selected images in each area of the grid.
8. A method as claimed in any one of claims 1 to 7 wherein the screen is in a form of a window.

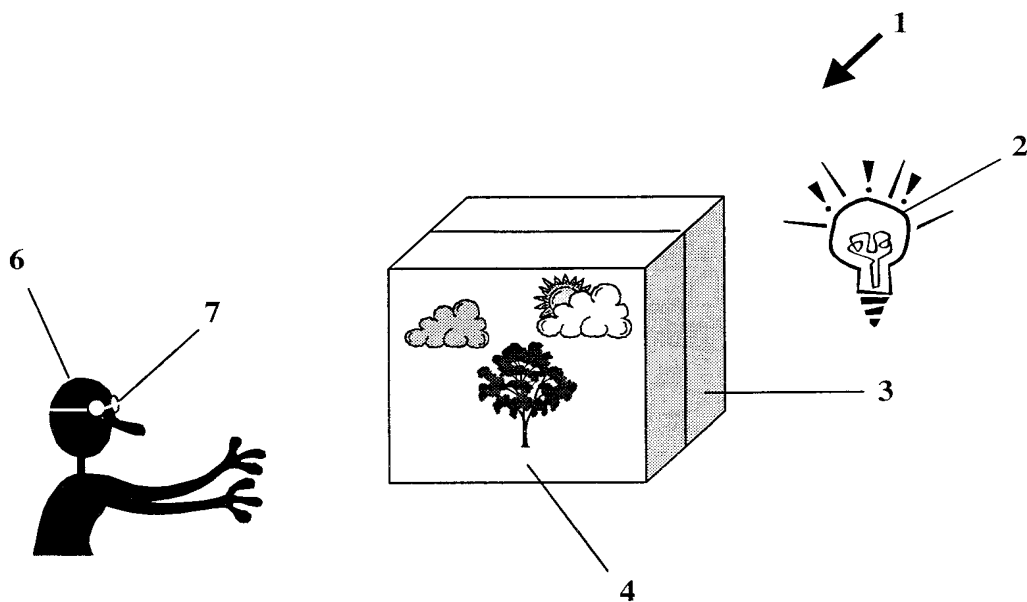
9. A method as claimed in any one claims of 1 to 7 wherein the screen is in a form of a one-way mirror.
10. A method as claimed in any one claim of 1 to 7 wherein the screen is in the form of a video display unit.
11. A screen for use with a method as described above which can provide images of specific polarity, wherein the polarity of the selected images is different to that polarity of light emerging from other parts of the screen.
12. A screen as claimed as in claim 11 which includes a polariser.
13. A screen as claimed either claim 11 or claim 12 which includes a liquid crystal display.
14. A screen as claimed in any one of claims 11 to 13 wherein the screen is a video display unit.
15. A screen as claimed in any one of claims 11 to 14 wherein the screen is a liquid crystal display which does not have a front polariser.
16. A screen as claimed in any one of claims of 11 to 15 wherein the screen is divided into grids.
17. A screen as claimed in any one of claims 11 to 16 wherein a screen is a window.
18. A screen as claimed in any one of claims 11 to 17 when the screen is a one-way mirror.
19. A viewing device having adjustable polarity.
20. A visual alarm which includes a screen as claimed in any of claims 1 to 19.

21. A viewing device for viewing a screen according to any claims in claim 11 to 18 wherein the viewing device has coloured tinted glasses.
22. A visual alarm operating according to the method as claimed in any one of claims 1 to 10.
23. A method substantially as herein described with reference to and as illustrated by the accompanying drawings.
24. A screen substantially as herein described with reference to and as illustrated by the accompanying drawings.
25. A viewing device substantially as herein described with reference to and as illustrated by the accompanying drawings.
26. A visual alarm substantially as herein described with reference to and as illustrated by the accompanying drawings.

**Fig. 1A**



**Fig. 1B**



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ00/00220

**A. CLASSIFICATION OF SUBJECT MATTER**Int. Cl. <sup>7</sup>: G02B 27/02, 27/28, G02F 1/1335, G08B 5/36, G09F 19/12

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC: A47F 11/-, G02B 27/-, G02F 1/-, G08B 5/36, G09F 19/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI, JAPIO Keywords: polari; view; imag, information; screen, display, window; hidden, secret, invisibl, latent, secur, code, encode; warn, alarm; glasses; tint

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4859994 A (ZOLA et al.) 22 August 1989 Column 2 line 49 to column 5 line 34, Figures	1, 5, 11-13, 15, 23-25
X	US 5793470 A (HASELTINE et al.) 11 August 1998 Columns 6-10, Figures 2-5, 9-11	1-5, 7-8, 11, 16, 23-25
X	Patent Abstracts of Japan, JP 04-107524 A (NEC CORP) 9 April 1992 Abstract	1, 5, 11-15, 23-25

☒ Further documents are listed in the continuation of Box C
 ☒ See patent family annex

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

15 February 2001

Date of mailing of the international search report

21 February 2001

Name and mailing address of the ISA/AU

 AUSTRALIAN PATENT OFFICE  
 PO BOX 200, WODEN ACT 2606, AUSTRALIA  
 E-mail address: pct@ipaaustralia.gov.au  
 Facsimile No. (02) 6285 3929

Authorized officer

**MICHAEL HALL**

Telephone No : (02) 6283 2474

## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/NZ00/00220**

<b>C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4879603 A (BERMAN) 7 November 1989 Whole document	1-7, 10-14, 16, 20, 22-26
X	US 5488496 A (PINE) 30 January 1996 Columns 4-8, Figures 2, 6, 10-14	1, 5, 7, 10-16, 19, 23-25
X	US 4431265 A (BENTON) 14 February 1984 Columns 2-4, Figures 1-3	1, 5-7, 10-11, 14, 16, 23-25
X	US 3867020 A (BRAUNHUT) 18 February 1975 Column 1 lines 9-53, column 2 lines 42-62, Figures	19, 25
X	US 5114218 A (BLACK et al.) 19 May 1992 Columns 3-6, Figures 1-5	21, 25

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/NZ00/00220**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member	
US	4859994	JP	2000031		
US	5793470	NONE			
JP	4107524	NONE			
US	4879603	EP	355957	JP	2089087
US	5488496	NONE			
US	4431265	NONE			
US	3867020	NONE			
US	5114218	NONE			
END OF ANNEX					